

We claim:-

1. A graft polyol having a bimodal particle size distribution  
5 and a total solids content of from 5 to 65% by weight,  
containing small particles having a particle diameter of from  
0.05 to 0.7  $\mu\text{m}$  and large particles having a particle diameter  
of 0.4 to 5.0  $\mu\text{m}$ , the peaks of the large and small particles  
10 measured by the Fraunhofer diffraction method in combination  
with polarization intensity differential scattering not  
overlapping, and a total content of the solids having the  
defined particle sizes consisting of a volume fraction of  
from 5 to 45% of small particles and a volume fraction of  
15 from 95 to 55% of large particles, these volume fractions  
summing to 100%.
2. A graft polyol as claimed in claim 1, which contains small  
particles, which are characterized by a peak which begins in  
a range of from 0.05 to 0.08  $\mu\text{m}$  and ends in a range of from  
20 0.4 to 0.7  $\mu\text{m}$  and large particles which are characterized by  
a peak which begins in a range of from 0.4 to 1.0  $\mu\text{m}$  and ends  
in a range of from 1.2 to 5.0  $\mu\text{m}$ , measured in each case by  
the Fraunhofer diffraction method in combination with  
25 polarization intensity differential scattering, the measured  
peaks not overlapping.
3. A graft polyol as claimed in claim 1 or 2, which has a  
viscosity at 25°C which is at least 5% lower than a graft  
polyol having a monomodal particle size distribution and  
30 exclusively small or large particles, assuming that the graft  
polyols to be compared do not differ in solids content and in  
the starting materials.
4. A graft polyol as claimed in any of claims 1 to 3, wherein  
35 the small particles have a diameter of from 0.1 to 0.5  $\mu\text{m}$  and  
the large particles have a diameter of from 0.5 to 4.0  $\mu\text{m}$ .
5. A graft polyol as claimed in any of claims 1 to 4, wherein  
the total solids content of the graft polyol is from 10 to  
40 50% by weight.
6. A graft polyol as claimed in any of claims 1 to 5, wherein  
the total content of the solids having the defined particle  
45 sizes consists of a volume fraction of from 10 to 40% by  
weight of small particles and a volume fraction of from 90 to

Fig.

60% by weight of large particles, these volume fractions summing to 100%.

7. A process for the preparation of graft polyols having a  
5 bimodal particle size distribution as claimed in claim 1,  
wherein at least one graft polyol having a monomodal particle  
size distribution with small particles which have a diameter  
of from 0.05 to 0.7  $\mu\text{m}$  and at least one graft polyol having a  
monomodal particle size distribution with large particles  
10 which have a diameter of from 0.4 to 5.0  $\mu\text{m}$  are mixed with  
one another in a ratio such that the total solids content of  
the resulting graft polyol having a bimodal particle size  
distribution consists of a volume fraction of from 5 to 45%  
of small particles and a volume fraction of from 95 to 55% of  
15 large particles, the volume fractions summing to 100%.
8. A process as claimed in claim 7, wherein the graft polyol  
having a monomodal particle size distribution with small  
particles which is used is one having a particle diameter of  
20 from 0.1 to 0.5  $\mu\text{m}$ .
9. A process as claimed in claim 7 or 8, wherein the graft  
polyol having a monomodal particle size distribution of large  
particles which is used is one having a particle diameter of  
25 from 0.5 to 4.0  $\mu\text{m}$ .
10. A process as claimed in any of claims 7 to 9, wherein the  
graft polyol having a monomodal particle size distribution  
with small particles is used in a volume fraction of from 10  
30 to 40% and the graft polyol having a monomodal particle size  
distribution of large particles is used in a volume fraction  
of from 90 to 60%, these volume fractions summing to 100%.
11. A process for the preparation of a graft polyol having a  
35 bimodal particle size distribution as claimed in claim 1 in a  
semibatch process, wherein the initially taken reaction  
mixture contains in each case at least one carrier polyol, a  
macromer and a graft polyol having a monomodal particle size  
distribution, more than 3% by weight of the solids content in  
40 the resulting graft polyol consisting of the solids content  
of the graft polyol used in the initially taken reaction  
mixture and having a monomodal particle size distribution,  
and the weight of the macromer used in the initially taken  
reaction mixture is from 1 to 30% by weight, based on the  
45 total weight of the ethylenically unsaturated monomers used,

which is at least sufficiently large that small particles are formed in the further course of the reaction.

12. A process as claimed in claim 11, wherein the amount of  
5 macromer used in the initially taken reaction mixture is from 2 to 15% by weight, based on the amount of the ethylenically unsaturated monomers used for the resulting graft polyol.
13. A process as claimed in claim 11 or 12, wherein the macromer  
10 is a polyol having an average molecular weight of more than 2 000 g/mol and a functionality of  $\geq 2$ , which possesses at least one terminal, polymerizable, ethylenically unsaturated group.
- 15 14. A process as claimed in claim 13, wherein the macromer is a polyol having an average molecular weight of more than 3 000 g/mol.
15. The use of a graft polyol as claimed in any of claims 1 to 6  
20 for the preparation of polyurethanes.
16. A process for the preparation of polyurethanes by reacting organic and/or modified organic polyisocyanates (a) with graft polyols (b) and, if required, further compounds (c)  
25 having hydrogen atoms reactive toward isocyanates, in the presence of catalysts (d), if required water and/or other blowing agents (e) and, if required, further assistants and additives (f), wherein the graft polyols (b) used are those having a bimodal particle size distribution and a total  
30 solids content of from 5 to 65% by weight, containing small particles having a diameter of from 0.05 to 0.7  $\mu\text{m}$  and large particles having a diameter of from 0.4 to 5.0  $\mu\text{m}$ , the peaks of the large and small particles measured by the light scattering method not overlapping, and a total content of  
35 solids having the defined particle sizes consisting of a volume fraction of from 5 to 45% of small particles and a volume fraction of from 95 to 55% of large particles, these volume fractions summing to 100%.

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